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MEMORANDUM

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SUBJECT: Section 18-Use of Myclobutanil on Cucurbits in Pennsylvania

FROM: Kathryn Montague, Biologist 4/15/98
Thuy Nguyen, Chemist 4/16/98
Environmental Risk Branch III
Environmental Fate and Effects Division (7507C)

THRU: Daniel Rieder, Chief 4/21/98
Environmental Risk Branch III
Environmental Fate and Effects Division (7507C)

TO: Robert Forrest, PM 05
Registration Division (7505C)

A. Risk Characterization Summary

The proposed use of myclobutanil on cucurbits in Pennsylvania does not appear to pose adverse effects to birds, mammals, fish, or aquatic invertebrates. Risk to nontarget plants could not be assessed due to lack of data; therefore, risk to plants remains a possibility, which could be minimized by taking precautions to minimize spray drift. Risk to nontarget insects could not be assessed due to lack of data; therefore, risk to nontarget insects remains a possibility from the proposed use of myclobutanil. Myclobutanil is relatively persistent, with an average field half-life of 129 days. The major route of dissipation is believed to be diffusion and dilution; myclobutanil appears to be resistant to most environmental breakdown processes.

B. Submission Purpose

The Pennsylvania Department of Agriculture has applied for a special exemption to use Nova 40W fungicide containing myclobutanil on a total estimated 14,400 acres of cucurbit crops to treat powdery mildew (*Spaerotheca fuliginea*). The maximum estimate for total required active ingredient is 2,880 lb ai for the season. This is based on up to 2 applications of Nova 40 W at 2.5 oz. (0.1 lb ai) per acre applied by ground sprayer at the first sign of disease. Applications are to be made with a 7-10 day treatment interval, with a 1 day interval prior to harvest. Applications will be made between July and September, 1998. Contact fungicides (copper, sulfur, chlorothalanil) are effective against powdery mildew at the site deposited; however, they are not systemic, and so do not provide adequate protection for the undersides of the leaves. The leaves die prematurely when the powdery mildew is not suppressed on the underside, resulting in lower yields for the crop. Registered systemic fungicides for powdery mildew control (triademefon, benomyl, and thiophanate-methyl) are no longer effective due to resistance. There are no effective cultural practices which adequately control powdery mildew.

Product Information:

Product Name: Rally 40 WSP manufactured by Rohm and Haas Co.
Active Ingredient: Myclobutanil.....40%
Inert Ingredients.....60%

C. Environmental Assessment

1. Environmental Fate and Exposure Characterization

Environmental Fate Data:

- Stable to hydrolysis at pH 5, 7, and 9
- Stable to photolysis in water
- Photolytic soil half-life = 143 days
- Aerobic soil half-life = 66 days
- Anaerobic soil half-life = no degradation at 62 days
- Terrestrial Field Dissipation half-life = 292 days in sandy loam, and 92 days in loam soil. No apparent leaching was observed at either site.
- Solubility = 142 ppm
- Leaching: myclobutanil is moderately mobile (K_ds = 1.46 - 9.77 for adsorption and 0.47 - 4.18 for desorption in 5 soils), with a median K_{oc} = 581. The degradate (1,2,4-triazole) is considered highly mobile, with a median K_{oc} = 104 (average of 112) .

2. Estimated Environmental Concentrations

Aquatic:

The aquatic EECs presented below were generated using the GENEEC computer program developed by EFED. This program uses a variety of environmental fate parameters in conjunction with the application rate to estimate the exposure to aquatic organisms from runoff.

GENEEC EECs (µg/L) for Myclobutanil Use on Cucurbits

INPUT VALUES

RATE (#/AC) ONE(MULT)	APPLICATIONS NO.-INTERVAL	SOIL KOC	SOLUBILITY (PPM)	% SPRAY DRIFT	INCORP DEPTH(IN)
.100 (.196)	2 7	581.0	142.0	1.0	0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
129.00	0	N/A	0.00-0.00	0.00	0

GENERIC EECs (IN PPB)

PEAK GEEC	AVERAGE 4 DAY GEEC	AVERAGE 21 DAY GEEC	AVERAGE 56 DAY GEEC
3.67	3.61	3.32	2.92

Terrestrial--Acute

Vegetation Type	Peak Maximum EEC[1]	Average Maximum EEC[1]
Short grass	47 ppm	36 ppm
Tall grass	22 ppm	17 ppm
Broadleaf plants/insects	26 ppm	20 ppm
Fruits/seeds	3 ppm	2 ppm

[1]From FATE program-- based on 2 applications at 2.5 oz product (0.1 lb ai)/A with a 7-day application interval. Initial concentration was the maximum Kenaga value for the vegetation type. Average EEC is for a 15-day period following the initial application.

Terrestrial--Chronic

Vegetation Type	Peak Mean EEC[1]	Average Mean EEC[1]
Short grass	17 ppm	13 ppm
Tall grass	7 ppm	5 ppm
Broadleaf plants/insects	9 ppm	7 ppm
Fruits/seeds	1 ppm	1 ppm

[1]From FATE program--based on 2 applications at 2.5 oz product (0.1 lb ai)/A with a 7-day application interval. Initial concentration was the mean Fletcher value for the vegetation type. Average EEC is for a 15-day period from the initial application.

3. Ecological Toxicity Data Summary

The following toxicity data has been reviewed in conjunction with registration of myclobutanil.

Terrestrial Wildlife Toxicity Data

Common Name	%AI	Toxicity	NOEL	EPA-ID	CATEGORY
Bobwhite Quail	84.5	LD_{50} 510 mg/Kg		0144286	C
Bobwhite Quail	84.5	LC_{50} >5000 ppm		0144287	C
Mallard Duck	84.5	LC_{50} >5000 ppm		0144287	C
Bobwhite Quail	94.2	LOEC >260 ppm	260 ppm	43087901	S
Mallard Duck	94.2	LOEC >260 ppm	260 ppm	43087902	S

Laboratory rat	91.9	Acute oral LD50=1360 g/kg		006370	C
Laboratory rat	84.5	2-gen. Repro LOEL=1000 ppm	200 ppm	004936	C
Laboratory rat	84.5	2-gen. Systemic LOEL=200 ppm	50 ppm	004936	C

Aquatic Organism Toxicity Data

Common Name	%AI	Toxicity	NOEL	EPA-ID	Category
Bluegill sunfish	84.5	96 HR LC50=2.4 ppm		0144285	C
Rainbow trout	84.5	96 HR LC50=4.2 ppm		0141677	C
Water flea	84.5	48 HR EC_{50} =11 ppm		0141678	C
Sheepshead minnow	93	96 HR LC_{50} =4.7 ppm		42747903	C
Eastern oyster	93	96 HR EC_{50} =0.68 ppm		42747901	S
Mysid	93	96-HR LC50 = 0.24 ppm		42747902	C
Fathead minnow		Early life LOEC=2.2 ppm	0.98 ppm	0266119	S

4. Hazard Assessment

Terrestrial Organisms

Acute Risk: The maximum expected residue of myclobutanil in the environment is 47 ppm. This value was calculated using the FATE program, with an initial input of 24 ppm (the maximum "Kenaga" value of 240 ppm/1 lb ai/A for short grass x the application rate of 0.1 lb ai/A). This produces acute risk quotients of 0.01 for birds and 0.03 for mammals, both of which are well below the high risk, restricted use, and endangered species levels of concern (LOCs).

Chronic Risk: Average residues of myclobutanil are expected to be 36 ppm or less for a 15-day period from the time of the first application. This value was calculated using the FATE program, with an initial input of 8.5 ppm (the mean "Fletcher" value of 85 ppm/1 lb ai/A for short grass x the application raate of 0.1 lb ai/A). This results in risk quotients of 0.14 for birds and 0.72 for small mammals, which are below the LOC for chronic risk.

Aquatic Organisms

Acute: Toxicity endpoints for the species tested were compared to the peak EEC (0.004 ppm). RQs ranged from 0.00-0.02, which are well below and LOC for aquatic organisms.

Chronic: The fish early life-stage NOEC (0.98 ppm) was compared to the 56-day GENEEC value (0.003 ppm); no chronic hazard was indicated for the proposed use of myclobutanil on hops.

Hazard to Terrestrial Plants:
No data on toxicity of myclobutanil to terrestrial species of plants has been reviewed to date. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Hazard to Non-Target Insects Toxicity Data: No data has been received for review by the Agency regarding toxicity to non-target insects. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Endangered Species: There are no endangered species concerns indicated for birds, mammals, fish, or aquatic invertebrates. Risk to nontarget plants and insects could not be assessed due to lack of data; therefore, the possbility of risk to endangered plant or insect species cannot be precluded. There are endangered plant species present in several counties in Pennsylvania: Small Whorled Pogonia (Centre and Venango counties); Northeastern (Barbed Bristle) Bulrush (Clinton, Cumberland, Dauphin, Franklin, Huntingdon, Lackawanna, Monroe, and Union counties). No endangered insect species are listed for Pennsylvania.

D. Labeling Recommendations

Section 18 Label
Do not apply directly to water, or to areas below the mean high-water mark. Do not contaminate water when disposing of equipment washwater or rinsates.

Product Label
For terrestrial uses, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Do not apply when weather conditions favor drift or runoff from areas treated.